Safety Hot Spot: Aircraft Icing Safety Checkup

Flight Planning

- ✓ **Plan ahead** — Check the weather the night before your flight to see if snow, freezing rain, or frost is in the forecast. If it is, hangar the airplane for the night or plan to arrive at the airport early, giving yourself ample time to deice.
- ✓ **Gloves, hats, and boots** — Preflight will take longer, and it's easier to do a thorough job if you're warm and comfortable. Good winter gear may also help ensure survival in the event of an off-airport landing.
- ✓ **Weather briefing** — When checking the weather, pay particular attention to the possibility of in-flight icing. Look for icing airmets and pilot reports along your route of flight. In much of the country, from October through March (or longer), the "I" in IMC stands for "ice."
- ✓ **Lapse rate** — The temperature lapse rate (standard is 3.5 degrees Fahrenheit, or two degrees Celsius, per thousand feet) determines the freezing level. Particularly during spring and fall, balmy temperatures on the ground can make it easy to forget that the clouds may be cold enough to hold ice.
- ✓ **Aircraft equipment** — Unless your airplane is certified for flight into icing (and few GA aircraft are), the law and good sense both require you to steer clear of icing conditions. Don't rely on "non-hazard" anti-icing equipment: These systems are only intended to buy you time in the event of an *inadvertent* icing encounter. For more information, refer to the Aircraft Deicing and Anti-icing Equipment Safety Advisor (http://www.aopa.org/asf/publications/sa22.pdf).

Preflight

- ✓ **Walk-around** — Check that all ports on the airplane are clear (static, pitot, oil breather, stall warning horn, etc.). If the ice has started to melt, check that water hasn't pooled in control surface hinges or other places where it might refreeze and cause a problem later.
- ✓ **Inspection** — Visually inspect the top of each wing and the tail, looking for any traces of ice. Follow up by touching the surfaces to verify that they are ice-free. Small amounts of clear ice, which can disrupt airflow and cause the flight controls to become unbalanced, are particularly hard to see and may be detected only by touch.
- ✓ **Ice removal** — If ice is present on the aircraft, it must be completely removed before flight. Use the procedures recommended in the Cold Facts: Wing Contamination Safety Brief (http://www.aopa.org/asf/publications/SB02.pdf) to remove ice.
- ✓ **Snow Removal** — It may look like loose snow, but don't count on it blowing off during taxi or takeoff. Remove all snow (and any underlying ice) during your preflight.
- ✓ **Flashlights** — Use a flashlight to help detect ice during a night preflight, or in flight. Bring two, just in case you need a backup.
- ✓ **Engine preheat** — Preheat your engine before starting, particularly when the outside temperature is below 25 degrees Fahrenheit.

In Flight

- **Pireps** — When it comes to avoiding ice, pilot reports are some of the best tools at your disposal. Ask for them during your preflight briefing, and check with ATC or Flight Service for new ones en route. While you're at it, take a minute to give your own: Your fellow pilots will thank you! If you need a refresher on how to give a pirep, take ASF's SkySpotter online course (http://www.aopa.org/asf/online_courses/skyspotter/).
- **Get the picture** — Keep the "big picture" in mind when operating around potential icing conditions. Where are the fronts? How are they moving? Cloud bases and tops? Is the MEA below the freezing level? What escape routes are open should you encounter ice?
- **Ice is a drag** — Airframe ice disrupts airflow and degrades lift while adding drag and raising stall speeds. It can interfere with control response, clog engine air intakes, degrade propeller thrust, and form inside carburetors. It requires higher power settings-and higher fuel burn-to maintain airspeed. It can force a pilot to maintain altitude by increasing angle of attack; exposing the undersides of wings and fuselage to additional icing. In short, an icing encounter is a "death of a thousand cuts."
- **Picking up ice?** — Don't hesitate: Take action at the first sign of ice. Turn around, descend to warmer temperatures, climb to colder temps, or divert to a nearby airport. Tell ATC that you're picking up ice, and don't be afraid to ask for an "immediate" climb, descent or turn. If necessary, declare an emergency.

Aircraft Control

- **Airspeed is life** —The most obvious early symptom of airframe icing will be a decrease in airspeed. This is critical, because stall speed will be rising simultaneously-pushing you toward the so-called "coffin corner" where maximum and minimum airspeeds converge. Add power, watch airspeed closely and start working on an escape. If you've lost 10 knots, the situation is getting serious -- take action immediately!
- **Tail stalls** — Ice accumulation on the horizontal stabilizer can cause a tail stall, recovery from which requires pulling back on the yoke. Putting flaps down can sometimes precipitate a tail stall, so it's a very good idea to keep them up if you're carrying ice. For more information on tail stalls, read ASF's Aircraft Icing Safety Advisor (http://www.aopa.org/asf/publications/sa11.pdf).
- **Careful with flaps** — Lowering flaps can result in unpredictable aircraft behavior. In most light singles, it's probably best to leave them up for landing, if possible, but be prepared to make your approach and landing at a higher-than-normal airspeed. Fly the aircraft all the way to the runway. Since you'll be making the approach at a significantly higher airspeed, this is **not** the time to be going to a short field.

Airport Operations

- **Airport Diagrams** — It's easy to get lost at snow-covered airports when runway and taxiway markings are hidden. Download and print free airport taxi diagrams (http://www.aopa.org/asf/publications/taxi/)from ASF; use them to help increase your situational awareness.
- **Taxiing** — Taxi at a slower pace when surface areas are covered in snow or slush. Use the aircraft's brakes sparingly to avoid sliding across icy patches. Rely on the aircraft's throttle and rudder to control speed and direction. Don't program the GPS or run checklists while taxiing on ice or snow.
- **Braking action reports** — At towered airports, pay attention to braking action reports. If conditions are reported as *good* or *fair* you're probably OK for taxi, takeoff and landing, but allow extra distance for all operations. If the report is poor or nil, you may want to rethink your entire flight, or, if airborne, divert to another airport. Even light crosswinds will complicate landings.
- **Runup** — Position the airplane on dry pavement if possible, away from other people and aircraft. As you bring the throttle up to check the engine and instruments, look outside to be sure that you're not sliding on ice.